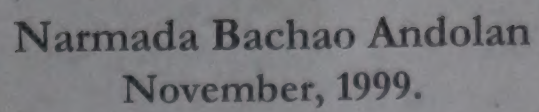


## Task Force Reports of the Madhya Pradesh Government





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Narmada Bachao Andolan  
62, Mahatma Gandhi Marg  
Badwani, Madhya Pradesh – 451 551.  
Phone: 0265-382 232, 07290-22464  
Email : nba@lwbdq.lwbbs.net.in  
: narmada@fnmail.com  
Website : www.narmada.org

***Community Health Cell***  
Library and Documentation Unit  
367, "Srinivasa Nilaya"  
Jakkasandra 1st Main,  
1st Block, Koramangala,  
BANGALORE-560 034.  
Phone : 5531518



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## PREFACE

The entire Narmada Valley is standing at a crossroad today. Around three to four decades ago the Central and the concerned State governments had planned and envisaged the development of the Narmada Valley – mainly through the construction of 30 large dams, 135 medium dams and 3000 small dams.

Six of these dams have already been completed: Bargi, Barna, Tawa, Sukhta, Kolar, Matiari. The experience of these dams has been bitter. In Bargi, where 101 villages were scheduled to be submerged, finally when the reservoir waters rose, 162 villages and 22 rehabilitation sites were inundated. Not a single of the thousands of families displaced have rehabilitated till date. Yet, only 5% of the proposed irrigation capacity of the Bargi Project has been realised till now – mainly because the Government had no money to construct the canals.

Yet, without evaluating the lessons of the already constructed dams, several large dams are now being constructed on the Narmada and her tributaries. These include the Sardar Sarovar Project in Gujarat, the Maheshwar and Narmada Sagar Projects in Madhya Pradesh – all being constructed on the Narmada itself as well as the Man, Jobat, Veda and Goi projects being constructed on the tributaries. Except the Sardar Sarovar Project, which is an inter state project, and the fate of which will be decided in the Supreme Court of India, all the other 29 large dams lie in Madhya Pradesh.

For the last 15 years, a battle has raged in the valley against the controversial Sardar Sarovar Project. The Adivasis and peasants of the Valley have raised important questions about the proposed mass displacement and destruction of the lands and forests of the valley, the impossibility of such large scale rehabilitation, environmental losses, seismic risks, water-logging and salinisation in the command area, the right of the affected people to information and consultation, the benefits and costs of the project, etc. Today, the struggle has spread to the impact zones of the Maheshwar, Narmada Sagar, Man, Jobat, Veda and Goi projects as well. The people of the Narmada Valley are standing up as one, under the aegis of the Narmada Bachao Andolan, to ask whether these big dams constitute development or destruction.

In the Maheshwar area, the struggle has not only raised the question of mass displacement of the people of 61 villages, the impossibility of rehabilitation, and the destruction of thousands of acres of fertile, irrigated lands, but also the brought into focus, the prohibitively expensive power – Rs.6 to Rs.8 per unit at production point that this project will produce, which combined with the faulty terms and conditions of the agreement of the state of Madhya Pradesh with the private power producer, S. Kumar's, will spell financial ruin for the government and the people of the state.

In response to the pressure of the struggle that culminated in the capture of the Maheshwar dam site by thousands of people, the Madhya Pradesh Government, in January 1998, constituted a Task Force to review the big dams in the Narmada Valley and search for alternatives. This Task Force comprised of senior government officials, well known water and energy experts and members of the Narmada Bachao Andolan. The Task Force was also entrusted with the review of the Maheshwar Project on a priority basis.

The Task Force took cognisance of the changed circumstances in the valley. For example, irrigation already achieved in the command areas of projects yet to be constructed has changed the need for these big dams. For example, the Man Project command area has already achieved 54% irrigation, the Jobat Project command area has achieved about 73% irrigation and the Goi Project command area has achieved over 80% irrigation – all these through other sources, and without the big dams. It has also become clear that the extent of displacement will be larger by several orders



of magnitude than anticipated. The new seismic activity in the Narmada valley is also a matter of concern. It has also been recognised that the water available in Narmada is not 28 MAF as estimated but 22.7 MAF. Similarly, it is also clear that adequate finances are nowhere available for the construction of these big dams.

The question then is how to meet the valid water and energy needs of the population, and how to use the waters, lands and forests of the Narmada valley in the most productive manner possible without causing mass destruction or displacement, and irreversible changes like forest loss, floods and earthquakes?

The Task Force constituted by the Madhya Pradesh government deliberated for 8 long months. The Maheshwar Task Force report unambiguously recommended that all construction work on the Maheshwar dam must be stalled until

- a) A fresh benefit – cost analysis of the Project is carried out, which establishes the economic viability of the Project.
- b) A rehabilitation plan based on the actual availability of land, and the principles of land for land, land for the landless, and community resettlement, be worked out, which establishes the real possibility or rehabilitation.

The Task Force also detailed alternatives to the Maheshwar Project such as 180 MW pump storage on the Bargi Dam, gasifier alternatives, demand side management measures, micro-hydel projects, and restructuring of fuel oil projects.

The General Task Force report elaborates a set of principles and a framework for the alternate development of the resources of the Narmada valley as well as concrete decentralised energy and water options. Clearly this process and initiative will have to be deepened and broadened further.

In the meanwhile, as an outcome of the continuing struggle of the people of the Narmada Valley, the Madhya Pradesh Government has taken several important decisions which include review of the Narmada Sagar Project, stopping all work on the dam spillway, joint implementation of energy and water alternatives in lieu of Veda and Goi big dams, review of seismicity in the Narmada Valley with regard to the large dams, etc.

We enclose the two Task Force reports – the Maheshwar Task Force report as well as the General Brief report of the Task Force for suggestions and critical review. We hope that these reports will stimulate large scale debate and involvement in furthering the concrete processes of alternative development unfolding in the valley.

Date : 29.10.1999

Alok Agrawal  
Medha Patkar  
Narmada Bachao Andolan.



Government of Madhya Pradesh  
Narmada Valley Development Department Ministry

No.12-1-112-27-2-97/104

Bhopal Date 29-1-98

Order

1. After discussions of the recommendations of the workshop on the subject "Narmada Valley Development- Search For Alternatives", held on 16 and 17 Dec 1997 in the Academy of Administration, it was decided that looking at the size, nature and complexities of the present problems of the Narmada Valley Development a Task Force will be constituted to look into the alternatives to the Narmada Valley Projects and in addition to have detailed discussions on an alternate model of development and give recommendations to the Government.
2. As per the above decision, the following Task Force is being constituted:
  - A. On behalf of the Narmada Valley Development Authority:
    1. Shri S.B.Khan, Member Energy.
    2. Shri A.M.Nayak, Member, Engineering
  - B. On behalf of the state government
    1. Shri A.Bajendra Kumar, Coordinator, Rajiv Watershed Mission.
    2. Project Officer, Rural Development Corporation, Khargone
  - C. Representative nominated by Energy Department
  - D. Special Representatives
    1. A.K.N. Reddy.
    2. Shri K.R. Datey
    3. Ramchandra Singh Dev
  - E. Narmada Bachao Andolan
    1. Shri Alok Agarwal
    2. Ms. Medha Patkar
3. The nodal agency of this Taskforce will be the Academy of Administration and Shri Sharadchandra Behar, Director-General will be the Chairperson of the task force. The budget required for the Task Force will be provided by Narmada Valley Development Authority.
4. The discussions as per requirement can consult or invite other experts for discussions. More experts can be included in the Taskforce by the Chairperson if required.



5. What work will be done in what time frame and its time limit will be decided by the Task Force.

The report of the Taskforce will be submitted by 30 June, 1998.

As per the order of and in the name of the  
Governor, Madhya Pradesh.

Signed / -

M.M. Khandelwal

Upper Secretary

Narmada Valley Development Department Ministry

Bhopal. Date: 29-1-98

No. 12-1-112-27-2-97/105

cc:

1. Chairperson and Deputy Chairperson, Narmada Valley Development Authority, Bhopal
2. Shri Sharadchandra Behar, Director, Academy of administration and Chairperson, taskforce, Bhopal
3. Commissioner, Indore / Jabalpur Section.
4. All members of Narmada Valley Development Authority.
5. Shri S.B. Khan, Member, (Energy ) Narmada Valley Development Authority.
6. Shri A.M.Naik, Member (Engineering), Narmada Valley Development Authority
7. Managing Director, energy Development Nigam, Bhopal.
8. Shri Baijendra Kumar, Co-ordinator, Rajiv Gandhi Watershed Mission.
9. Project Officer, Rural Development Corporation, Khargone.
10. Shri A.K.N. Reddy, 25/5, Borebank Road, Benson, bangalore-560046.
11. Shri K.R.Datye, Kasad, Gansh Kutir, 1<sup>st</sup> Floor, 68, Prathna Samaj Road, Vile Parle(E), Mumbai-400057.
12. Shri Ramachandra Singh Dev, E-101/13, Shivaji Nagar, Bhopal.
13. Shri Alok Agarwal, Narmada Bachao Andolan.
14. Sushri Medha Patkar, B-13, Shivam Flats, Ellora Park Road, Baroda-390007.
15. Collector, Indore/Jabalpur/Khandwa/Dhar/Jabua/Narsinhpur for information.

M. M. Khandelwal

Upper Secretary

Narmada Valley Development Department Ministry



Government of Madhya Pradesh  
Narmada Valley Development Department Ministry

No.12-1-112-27-2-97\106

Bhopal Date 30-1-98

To,  
Chief Secretary  
Energy Department,  
Ministry, Bhopal.

As ordered, it is requested that construction work under the Maheshwar project of the dam and power house as well work related to land acquisition should be stayed at the present. Only those works of resettlement can be continued that can be put to alternative use later on. Appropriate decision in this regard will be taken by the Government after the report of the Task Force set up under the department order no. 12-1-112-27-2-97\ 104 Bhopal dated 29-1-98 is obtained.

Signed / -  
M.M. Khandelwal  
Upper Secretary  
Narmada Valley Development Department Ministry  
Bhopal. Date: 30-1-98

Pg. No. 101 110-07

cc:

16. Chairperson, Madhya Pradesh Electricity Board, Jabalpur.
17. Chairperson, Narmada Valley Development Authority, Bhopal.
18. Shri Sharadchandra Behar, Director General, Academy of administration and Chairperson, taskforce, Bhopal
19. Commissioner, Indore Division.
20. Collector, Khargone.

sent to the above for information and action.

M. M. Khandelwal  
Upper Secretary  
Narmada Valley Development Department Ministry



Government of Madhya Pradesh  
Narmada Valley Development Department Ministry

No.12-1-112-27-2-97\108

Bhopal, Date 30-1-98

Order

The Task Force created by this department as per the order no. 12-1-112-27-2-97\ 104 Bhopal, dated 29-1-98, will consider and review the Maheshwar project and give its report on priority basis.

Signed / -

M.M. Khandelwal

Upper Secretary

Narmada Valley Development Department

Bhopal, date: 30-1-98

Pg. No. 10-1.110 07 8 97----

cc:

21. Shri Sharadchandra Behar, Director General, Academy of administration and Chairperson, taskforce for information. As per the order it is requested that the Maheshwar Project be REviewed on a priority basis and report be presented.
22. All members/ representatives, Task Force, for necessary action.

M. M. Khandelwal

Upper Secretary.

Narmada Valley Development Department.



**ACADEMY OF ADMINISTRATION  
MADHYA PRADESH  
BHOPAL**

No. 5178

Bhopal Dated 15.10.98

To  
Shri Alok Agrawal  
Barwani  
Madhya Pradesh

Sub : A draft report on the Chapter of Maheshwar Hydel Power Project.

Please find enclosed, herewith, a draft report of the Task Force on the Chapter of Maheshwar Hydel Power Project for your perusal please. The comments on the draft chapter, if any, may please be sent within a week time.

Encl : as above

(S.K.Khare)  
Secy., Task Force



# **TASK FORCE TO STUDY NARMADA VALLEY DEVELOPMENT OPTIONS**

## **A DRAFT REPORT ON THE CHAPTER OF MAHESHWAR HYDEL POWER PROJECT**

The Maheshwar Hydroelectric Project has been an important point of discussion right through the deliberation of the Task Force. However two sessions were devoted specifically to this project so as to understand the basic stand taken by the MPEB and the arguments put forward by the NBA and other subject experts. The project was cleared by the CEA in 1996 with Rs. 812.09 crores, plus US\$ 213.29 million i.e., Rs. 1707 crores as the total cost of the project. In the following section we present the gist of the deliberation in the following order.

1. The position of the MPEB in support of the Maheshwar Project, represented by Shri Mandloi, Member (Civil), MPEB, Govt. of M.P.
2. The argument offered against the continuation of the project, represented by Shri Girish Sant, Shri Alok Agrawal, Shri Paranjpye, Shri K. R. Datey and others.
3. The common points of agreement and of divergence.
4. The conclusions and recommendations.

### **1. The position of the MPEB in support of the Maheshwar Hydel Project (400MW, i.e. 716 Million units in 900% years dependability).**

1.1 Electricity, it is asserted, is a key input in the socio-economic development of the country, and at the end-of the 8th Plan(March 1997) the country was facing a shortage of about 11.5% (base generation) and about 24% (peaking power). By the end of VIII Five-Year Plan the total installed capacity was 84912 MW, implying a shortage of 14185 MW. The 9th 5-year Plan of the Govt. of India therefore envisages an addition of 8449 MW each year.

1.2 The need for electricity in MP is as important as the national need and that makes it necessary to generate as much power as possible in the shortest period of time. Even though MP was an energy surplus state 10year ago, and actually exported electricity to neighbouring states this position has been reversed today. The installed capacity is 3814 MW, while the actual energy available is only 2533 MW due to a plant load factor (PLF) of 66.4%. Keeping in view the peak demand of 5150 MW, the current shortage is to the extend of 2617 MW.

1.3 The share of hydropower of the state as a proportion of the total power has fallen from 34% (During the 6th plan) to 25.5% at the end of the 8th Plan. This is an undesirable trend, because the Nation policy requires a ratio of 40/60 (At present it is 28/72) for achieving the correct (optimal) mix between thermal and hydropower generation to maintain the system efficiency.

1.4 To bridge the gap between demand and supply in general and to increase the share of hydro power in particular the government adopted the policy of "private participation", and a total of 16 Power Purchase Agreement (PPAs) have been signed between 1991 to 1997 (together accounting



far 6500 MW of power). In spite of this, except for the SMHEP (Shri Maheshwar hydropower Project) no other company has been able to launch the projects on the ground.

1.5 In view of the extreme shortage of Plan funds for completing the ongoing projects and in view of the lack of enthusiasm on the part of private companies to invest in the power sector, it has become absolutely necessary to go ahead with the SMHEP.

1.6 Within the state of MP the western parts are short of natural resources, while the eastern parts are richly endowed. However, the creation of the State of Chhatisgarh is likely to be a reality very soon, after which the plight of western MP will be even more serious in favour of energy generation.

1.7 Further, the Master Plan as indicated by the NVDA requires that conservation storages must be provided as high up in the basin as possible, for enabling the reported use of water for power generation. This would enable the generation of hydropower at the least cost. This the MPEB believes that the entire hydro power potential as envisaged in the Master Plan must be harnessed as early as possible, by utilizing the 18.5 MAF of water allocated to MP by the Narmada Water Dispute Tribunal (NWDT).

1.8 By 1998, only six dams namely Tawa, Barna, Sukta, Kolar, Matiyari & Bargi have been completed. In addition, Indira Sagar, Omkareshwar, Maheshwar, Man and Jobat are in progress. However due to a paucity of funds the work on the ongoing projects has not gathered momentum. Therefore, in tune with the Central and State policy, the Maheshwar Project has been assigned to a private party.

1.9 The SMHEP will help in utilizing the allocated water, and also in reaping the maximum benefits, minimum submergence & minimum displacement of households.

1.9.1 The major Advantages of Hydel Power (especially SMHEP): Hydro Power is non-polluting, environmentally benign and it is technologically viable. In other words the, ISP / SMHEP and Omkareshwar, it is claimed offers the least cost expansion system.

- a) Hydro power plants have a life 60 years and it is free from price escalation because there is no material input cost involved.
- b) SMHEP will increase the load carrying capacity of the grid, avoids backing thermal plant dummy off peak hours, thereby improving the PLF of thermal plants.
- c) SMHEP will have spinning reserves, it is quick starting and responds quickly to load demand. Consequently it offers the cheapest rate among all available source of power. It also requires negligible amounts (0.5%) of auxiliary power.
- d) SMHEP will lead to \_\_\_ which is relatively very small, and if developed well it will offer a good tourist spot. Being a run off river project it requires relatively less impounding and that too mostly the confined to the banks. It will submerge only 13 villages completely and 873 Ha. of cultivated agricultural lands. There is no loss of forest under submergence.
- e) During the Rabi season the overall demand rise, thereby leading a fall in voltage from 400 KV to 320 KV, causing fluctuation, oscillations and damage to equipment of consumers. The additional power from Maheshwar will reduce these losses. Further the transmission losses (from eastern MP to Western MP) amounting to 24 MW will also be saved, thereby impounding the system efficiency.
- f) It is expected that the fish production will rise from 20 tons per year to 220 tons per year.



2. The arguments offered against the continuation of the SMHEP by the NBA and others. There are broadly divided into

- a) the Techno-Economic Arguments and
- b) The Social -cultural and Ethical Arguments.

## 2.1 The Techno-Economic Arguments

It was claimed by the opponents of the project that the levelised tariff of energy generated at SMHEP is likely to be Rs. 5.24 per unit at 2001-2002 price levels, and that this is far higher than anticipated by the authorities. The argument is that the total cost of the project will be at least Rs. 1707 crores, and if we assume annual discount rate of 12% (It is customary to take 12% as the rate of discount for calculating the financial rate of return) then it would be difficult to keep the levelised tariff below Rs.5.24 per unit.

2.2 Further, if the cost of non-peak energy is Rs.1.75 per unit, then the cost of peaking power from Maheshwar in year 2002 works out to be more than Rs. 7.25 per unit. Since the primary objective of the project is peaking power, the rate appears to be higher than comparable alternatives. In addition, 67% of the peaking energy will be generated during the Monsoon months, i.e. the period when peaking requirements are not high.

2.3 It is therefore suggested that other alternatives which may have economic & social cost should be considered.

### a) Optimum use of oil based power plants.

MPEB has planned (and signed PPAs) with several IPPs to put up base load power stations running on oil. Govt. of India has approved oil linkage for 1300 MW base load power stations (above a PLF of 65%) (These include 240 MW FO based DG sets). Use of these plants (capable of peaking duty) for base load may be necessary in the initial years but has no place in the long range planning. Use of precious oil in place of coal is also not economical and desirable. In the next 5 to 7 years, these plants should be shifted to peaking operation. Optimal use of these plants (for peaking) and use of saved oil to support additional peaking plants can improve the peak: base ratio, without increased oil usage. The 240 MW DG sets (FO based) can be shifted to peaking duty, and 400 MW DG sets (FO based) can be added, also for peaking duty, without increasing the oil consumption. This has two advantages :

- i) Instead of addition of 240 MW base load and 400 MW peaking plant (SMHPP) this plan will add 640 MW peaking stations. This will improve the base:peak ratio. The peaking energy availability will increase significantly.
- ii) The oil based plants have an year-round availability (even for off-peak generation) whereas SMHPP's availability is limited to at most two hours a day in the post-monsoon period.

Such restructuring of oil based projects will improve base:peak ratio and substantially improve capability of meeting even the base load short falls. This would be achieved at a lower or same cost as of SMHPP. In addition, the alternative can also avoid submergence and popular opposition.



#### **2.4 Transition to biomass based power (along with co-generation):**

DG sets running on High speed Diesel(HSD) are costly due to high cost of fuel. The initial investment is low and if oil is replaced by wood (gasification) then they become quite competitive when compared to the cost of peaking energy from SMHPP. The first year payments for SMHP project (- Rs 360 Crore) would be sufficient to buy 300 MW DG sets (HSD) [The investment cost of DG sets (fuelled by HSD is about Rs. 1.2 Cr/MW].

The possibility of being able to add wood-gasifiers is the real advantage in this option. Wood gasifier will reduce oil consumption and the cost of power. After addition of wood gasifier large parts of running costs would be local payments for wood (~ Rs. 21 lakh / MW p.a.). This will provide a substantial boost to the local rural economy. For 300 MW, local payments would be Rs. 60 –70 crore p.a. Biomass for gasifier can be wood or agricultural waste. In case of wood plantations, the land is the “catchment area” of the project, as this “un-submerged” land and the energy plantation on it will offer many other substantial advantages for local ecology and economy. As described by K.R. Datey, this option is eminently feasible without having the need to acquire the lands.

The wood-gasifier and associated system (inclusive of DG set) cost Rs. 1.8 Cr/MW. Gasifier will reduce diesel consumption by over 70%, while consuming 0.9 to 1Kg wood/kWh. The levelised cost of power from DG-Gasifier plants will be one third less than peak energy from SMHPP. In fact, the gasifier based power turns out to be cheaper than even the cost of all energy (cost averaged over peak and non-peak energy) of SMHPP.

#### **2.5 Reducing peak power demand (through efficiency improvements, Demand Supply Management ( DSM) scheme and load management):**

If DSM and decentralized options are integrated in planning they can substantially reduce our dependence on large centralized plants. And can avoid mass-scale displacement as well as environmental costs.

Single Point Connection The 2 million single point connections is a great source of concern for the power planners. on the one hand, consumption of these users have large share of lighting load and on the other hand, there is a concern that due to un-metered nature they tend to run other appliances which amount to theft of power. Under a DSM scheme, the MPEB can give out good quality CFLs to these households. These lamps, along with choke (ballast) and a decorative lamp protector can be fitted at the place of inefficient incandescent lamps. This will save 40 to 60 Watt per household. After considering the periodic costs for lamp and ballast replacement, inflation rate of 8% and cost of implementation; the levelised cost of energy saved works out to only Rs 1.8/kWh. This cost needs to be compared with the cost of peaking energy from SMHPP (i.e. levelised cost of Rs 5/U in 1997/98 prices). The total saving from existing 2 million connections would be at least 100 MW. The saving from retrofitting new connections will be additional.

Further, these consumers can be given an option to either opt for metered supply or to accept a small electronic load controller that will limit their load to one or two such lamps. This can help MPEB reduce the theft of power. Such load controller would cost about Rs 100 to Rs 150 if bought in bulk. The cost of reduced peak due to reduced theft will be far too less than even the CFLs. There is no easy way to estimate the, possible benefit of this option. But generally 50 watt saving per house can be assumed. This implies an additional saving of 100 MW in peak load.

A good DSM scheme has the potential of saving 200 MW in just these two areas.



There are several DSM and load management measures in other sectors. These have not been elaborated here.

## **2.6 Use of existing dams for pumped storage schemes.**

It is possible to generate much more electricity from existing dams and pumped storage schemes without major added submergence. Such schemes will also be more economical than the SMHPP. For example, additional 180 MW pumped storage can be developed on the existing Bargi Dam, by creating a very small reservoir in the down-stream riverbed. For a peaking duty of 3 hrs./day [The peaking duty of SMHPP is less than two hours a day in the post Monsoon period], an additional small capacity of coal thermal plant of 60 MW can supply the pumping energy need (during off peak hours). Other suitable sites for pumped storage also exist. Without considering such sites, this option can give nearly 60 % peaking power as that of SMHPP, without major problems of submergence and R&R (Rehabilitation and Resettlement). This will also reduce the spills from Bargi during the monsoon.

In a nutshell, it can be said that the cost of peak power from SMHPP is not low and many alternatives are feasible, that can give similar peak power benefit at much less financial cost. Further these alternatives are beneficial from the social aspect as they do not involve large scale submergence and associated social trauma, rather options such as Gasifier will provide much needed stimulus to local rural economy and create employment. Immediate steps should be taken to utilize our scarce financial and human resources to exploit potential of such cost effective and socially desirable options. Actions should be taken to restructure the present oil based projects, implement Gasifier, DSM projects as well as the pumped storage scheme described above. A combination of these low-cost options offers far more potential than the SMHPP.

## **2.7 The First Component: Switching to ROR (Runoff-River) for the river valley projects:**

The present Narmada Valley Development plan provides for a hydro capacity of 2100 MW, most of which is concentrated in the four projects of Omkareshwar, Maheshwar, Narmada Sagar & Bargi and none of them are planned on the basis of ROR operation. The first important modification, which needs to be considered is to change over to an ROR operation for these plants with immediate effect. As we have already noted, the role of hydropower has changed over these years and the role of hydro is mainly in helping meet peak demand. From this point of view, an operation of between 4 and 6 hrs at peak load is to be expected from these plants, i.e., between 1500 and 2200 hrs/yr. Our previous working on the SSP (Sardar Sarovar Project) suggests that this level of operation is possible with ROR operation. (The simulation carried out over a 42 year period suggested 2200 hrs/yr operation at SSP.) Thus, in terms of generation, ROR will match present levels of generation without compromising on peak load capacity.

The switch over to ROR will, on the other hand result in the following benefits:

- 1) The requirement of storage behind the dam will be substantially reduced, since only a regulatory capacity will be needed;
- 2) In the post monsoon period, a capacity equivalent only to diurnal capacity required for peak load operation will be required; and as a result of the above,
- 3) The total submergence area will be reduced significantly and permanent submergence will decrease and period of submergence will be restricted to the monsoon period only for most of the seasonally submerged area.



## **2.8 The Second Component: Dispersed Small and Medium Hydro Cascade for the Entire Valley.**

The second important investigation to be called before proceeding with the major hydro projects planned, is to investigate the potential of dispersed small and medium hydro power plants based on ROR throughout the entire valley. The very first step in this direction would be to add an ROR hydropower component to all existing small and medium irrigation projects in the river valley. This itself is likely to generate a significant amount of energy and add significant peak load capacity.

Ideally, these and the projects planned on the Narmada itself should be seen as a cascade in which individual projects make use only marginally larger than river bed storage (i.e., between the river bed level and the flood plain level) behind the dam.

If we assume only 30% of the rainfall from the Narmada Catchment as being utilized for power generation, with only a 20 m fall at Bargi and utilizing only half of the fall available up to SSP crest, utilized over a period of 60 days, we get an installation of 2512 MW (for calculations see Appendix 1) on the main river alone. If we are to provide for peak load benefit and a ratio of 1.5 in that respect, the potential installation is 3768 MW. This still does not take into account the fall on the tributaries, and even assuming a fall of only 20 m in the tributaries, we have potential for another 1000 MW. The point is that there is prima facie evidence that ROR based small and medium hydro projects cascade in the major schemes on the Narmada.

## **2.9 Set up a committee to estimate ROR based small and medium hydro capacity for the Valley.**

We would therefore suggest that the government may immediately set up a task force and fully equip it to study the potential of ROR based hydro project potential in the Narmada Valley and identify likely sites and estimate costs for the same. The Task Force will need to be guided by a strong team of experts well seized of the issue and having the right approach to it. We suggest that the task force be guided by Shri S. Sambamurthy, Shri K. R. Datey and Shri Madhavan. Shri Sambamurthy is former Chairman, Central Electricity Authority (CEA), Shri Datey needs no introduction to this gathering and Shri Madhavan has been member, Design, Central Water Commission dealing specifically with hydro projects. All of them are well seized of the issue of ROR based hydro project operation and have a long experience in all respects of hydro projects planning and implementation.

## **2.10 Third Component: Hybrid solar biomass fossil fuel thermal generation systems.**

By themselves the two steps described earlier would provide for a well dispersed capacity of at least around 3000 MW providing for a new power generation of between 1500 to 2200 hrs/yr and a pumped storage peak load facility of 300 MW. This in itself is an important benefit, but its potential would be fully realized only when it is integrated into a hybrid solar-biofuel-fossil fuel thermal generation system.

The system may be described as follows. The system consists of a set of well-dispersed thermal generation plants in the size range of between 2 and 10 MW capacity. These plants function as base load plants for the system. They are hybrid plants equipped to run on three kinds of fuel: coal or other fossil fuels, biomass and solar. They are estimated to run for around 3000



hrs/yr on coal or other fossil fuel, 2000 hrs/yr on solar heat and 2000 hrs/yr on biomass fuel, thus making for an operation of 7000 hrs/yr for a load factor of 80%.

Estimated costs for this kind of a system are given below in Table 1 and basis for these costs and estimates are discussed in the next section.

Table 1: Estimated costs of proposed hybrid system.

Source	Capital Cost Rs/kW	Cost Rs/yr	Fixed Cost Rs/yr	Fuel Cost Rs/yr	Total Hours of Operation hrs/yr
Hydro	25,000	3,500	0	3,500	1,500
Biomass	7,000	1,000	2,000	3,000	2,000
Solar Thermal	30,000	4,200	0	4,200	2,000
Steam Turbine Plant	35,000	7,000	3,000	10,000	3,000
<b>TOTAL</b>	<b>97,000</b>	<b>15,700</b>	<b>5,000</b>	<b>20,700</b>	<b>8,500</b>

$$\text{Cost of Power} = 20,700 / 8,500 \text{ Rs / kWh} = 2.44 \text{ kWh}$$

Estimation of Hybrid Power from the Narmada Cascade.

### (Appendix 1)

For purpose of estimation the catchment of the Narmada within MP is taken to be 8.5 MHa (a somewhat lower figure, but again, consistent with our upper bound approach), of which 1.5 MHa represent the catchment above Bargi. We are making minimalist assumptions since the objective is to arrive at an order of magnitude estimate alone. The cascade is assumed to be made up of structure dealing with about 20 m fall and it is assumed that the first fall is at Bargi and only half of the fall between Bargi river bed height and SSP crest height is utilized for power generation. Any relaxation of these assumptions would result in a higher power generation potential than estimated.

The river bed height at Bargi is 367 m, SSP crest is 140 m giving us a fall of 227 m of which according to assumption 113.5 m would be utilizable. It is assumed that this is done in seven 16 m stages. Due to the peculiarity of the shape of the Narmada basin, we may assume that the catchment between them (it would generally vary as the difference of squares), and so we assume that at every stage there is an addition of catchment of 1 MHa at each stage and corresponding flow.

It is assumed that the average annual rainfall 1000 mm for the catchment and 30% of it is utilized for power generation. Turbine and generator efficiency is assumed to be 70%. The period over which the flow is to be utilized is taken as 1500 hrs, corresponding to a little over 60 days. This determines the capacity, through actual hours of energy generation attributable to utilized flow can be estimated to add up to 25% to this basic figure.



On this basis the power available from the flow from a catchment of 1 MHa for a fall 1 m may be estimated as follows:

$$0.3 \times 1000 \text{ mm} \times 10^6 \text{ ha} \times 10 \text{ m}^3/\text{ha} \times \text{T/m}^3 \times 1 \text{ m} \times 1 \text{ kWh}/360 \text{ T.m} \times 0.7/1500 \text{ hrs} = 3889 \text{ kW} = 3.889 \text{ MW}$$

Therefore, total power available

$$\begin{aligned} &= 3.889 \times (1.5 \times 132 + 1 \times 112 + 1 \times 96 + 1 \times 64 + 1 \times 48 + 1 \times 32 + 1 \times 16) \\ &= 3.889 \times 646 \\ &= 2512 \text{ MW} \end{aligned}$$

## 2.11 Submergence and displacement

As per the report of MPFB the reservoir of Maheshwar Dam will submerge 5697 Ha. in which private land is 1060 ha. The project will fully affect 13 villages and partially affect 9 village's thereby affecting 2264 families. But the experience at Bargi Project reveals that the submergence anticipated by the Government is an underestimate and that the reality will be far more destructive. In all 61 villages and 4000 families will be affected by Maheshwar Project. The Rehabilitation Policy of the government provides for *land for land* and adequate rehabilitation and resettlement of the project affected families. But until now no family has received land for land and only cash compensation has been provided.

Besides human misery due to submergence and displacement, the project will lead to acute environmental problems. It will also submerge archeological sites and will have post-impoundment prejudicial impact on health of the inhabitants on the periphery of the reservoir.

## 3.0 Common points of agreement and of divergence

The relative relevance and validity of the concepts of *energy* and *electricity* engaged the attention of the task force. It was agreed that using the narrow concept of electricity excludes the other forms and sources of energy. It was therefore agreed that energy is a more useful and comprehensive concept for the purpose of planning. The concept of electricity however was considered to be more relevant and useful for the limited purpose of looking at the desirability of continuance or otherwise of Maheshwar Project.

The Task Force devoted a considerable amount of time in discussing various non-conventional source of energy. We are happy to report that the task force was quite excited about many non-conventional sources of energy that have not been tried in the State in the scale it is feasible. That is why elsewhere we have recommended that the MPEB should have independent and strong wing under the leadership of a very senior person, may be a Vice Chairman, or a member to exclusively devote itself to exploring, planning and implementing projects relating to non-conventional sources of energy. The Task Force is convinced that there is considerable scope in this area, definite that a amount substantial work can be done in this area given the necessary commitment.

It was also generally agreed that even if all feasible non-conventional sources are harnessed, it is not possible to meet the entire need of the State at the present level of proven



technology. All members agreed that non-conventional energy sources should be given priority, but while some felt that this priority is to be in respect of attention and investment, some others felt that it should also be temporal, i.e., in the first stage exclusive attention be paid only to non-conventional sources and only when it becomes necessary hydel and other projects of conventional kind should be taken up. The general consensus was that looking at the gestation period of conventional projects as also the growing chasm between demand and generation, it is necessary that conventional and non-conventional projects are taken simultaneously.

The Task force recommends that much greater emphasis is required to be given to conservation of power and preventing loss and wastage of power.

It was also generally agreed that widespread educational effort has to be carried out on a massive scale to encourage the consumers to use energy-saving lamps and other appliances.

A major disagreement in the task force was on the cost benefit analysis of the Maheshwar Project has been undertaken. Members from the NBA and some experts felt that cost would be much higher on account of the following factors:

1. The number of families likely to be adversely affected is much higher than shown in the project, partly because of unsatisfactory survey at the time of preparation of the project and partly because of the rise in number of families since the survey, particularly when adult children are treated as separate families as per the rehabilitation policy.
2. Submergence will lead to loss of resource-base like quarries of minor minerals that have not been taken account, while calculating the cost.
3. The environmental impact has also not been properly calculated and computed.
4. Submergence of archeological sites has also not been taken into account.
5. The dollar-rupee exchange ratio has been taken at an unrealistic level without taking into account the steep rate at which the ratio is changing adversely to the rupee.
6. The cost of the ideal package of R & R accepted by the government has not been included.

There was a considerable debate on this issue. The need to workout afresh the cost benefit in the framework presented in an earlier chapter is considered desirable and is recommended by the Task Force, as an exercise to be undertaken by the MPEB.

Some members particularly those belonging to NBA emphasised and presented some evidence to show that the conditions imposed by the Ministry of Environment and Forest while clearing the project have not been fulfilled; and in fact some of them have been violated. The MPEB disputed such a claim. This is a matter that requires verification on the spot and was not within the scope of the Task Force. In any case there was no disagreement on the necessity of the conditions being fulfilled both in letter and spirit. We therefore strongly recommend that the Government of M.P. should evolve an effective mechanism to monitor and ensure compliance with the conditions of the project and it should not be left with the executing agency to report a formal compliance.



The present state of rehabilitation and resettlement was another major issue of controversy. Understandably, those who are working at the grass roots in the field were very agitated on the tardy implementation of the rehabilitation programme. The MPEB disputed many of the allegations made by the grass-root workers in regard to the violation of rehabilitation policy. The Task Force therefore appointed a subcommittee to verify some of the cases on the spot in which both the MPEB and the NBA representatives were members. Unfortunately, for various reasons the representatives of the MPEB were not present during the spot verification as a result of which we could not obtain jointly agreed status report.

The Controversy on R&R had many dimensions. One was on the recent decision of the government after a visit to the Narmada Valley area by the Deputy Chief Minister Mr. Subhash Yadav to modify, and *liberalise* the Re-habilitation policy. It was argued on behalf of the members belonging to the NBA that this was a dilution of the existing policy rather than liberalisation. Their insistence was that the policy adopted for Sardar Sarovar must also apply to Maheshwar and other projects in the valley. Any change would imply adopting double standards - one for Sardar Sarovar when it is a matter of demanding strict adherence from the government of Gujarat and a different one in respect of other projects in Madhya Pradesh.

The Task Force was of the view that we must avoid any possible allegations of following different norms and standards and should strictly adhere to the same conditions for Maheshwar and other projects as we demand of Gujarat government in respect of Sardar Sarovar.

The four major components of the rehabilitation policy generally agreed to, by both Government of M.P. and the NBA in the context of Sardar Sarovar are:-

1. Giving land for land to the affected families including to the landless.
2. Settling the village as a community rather than in a disbursed manner;
3. Availability of a complete rehabilitation plan well in advance of taking up the construction work.
4. Satisfactory re-settlement to be complete before 31<sup>st</sup> of December in the year preceding the year in which the village / area is likely to be submerged.

It was the stand of many members that there is no comprehensive plan of R & R prepared for the Maheshwar Project. The representatives of the MPEB also agreed that while there is some plan, it is not a comprehensive plan for rehabilitation of all the affected families as per the rehabilitation policy.

A doubt was also raised regarding the availability of adequate land to follow the principle of land for land. The task force was informed of some land identified for the affected families but no assurance for availability of adequate land could be given to the task force. Hence we came to the conclusion that at present adequate land area has not been identified to enable allotment to all affected families.

The policy of the government to give cash compensation to affected families to buy land on their own where ever they can find was also seriously criticized by some members. Others felt that this is a reasonable approach so long as genuinely willing persons are given cost compensation. It was alleged that lower level functionaries are pressurizing affected families to take cash compensation. As stated elsewhere we could not arrive at a final conclusion in this regard in the absence of joint sub-committee visit. In any case, the Task Force is of the view that cash compensation should not be given to anybody excepting those who are really willing, for



ascertaining which there should be a dependable mechanism. In this context a circular issued by the government in 1996 was recalled in which conditions for paying cash compensation were indicated and were to be strictly followed. It was alleged that this circular of the government is being violated.

#### 4.0 Conclusions and Recommendations

While the Task Force is not in a position to express a final opinion about ground realities on to which and different versions were presented, it has no hesitation in recommending that rehabilitation policy should be strictly followed to which will imply preparation of a comprehensive plan also clearly indicating the feasibility of R&R in accordance with the policy, particularly the availability of adequate land for allotment to the oustees for resettlement of village as a community.

While the present status of R&R may have generated controversy and debate, there was no disagreement on the view shared fully by all the members of the task force that there is a need to adopt a much greater humane approach to R&R activities. This has particularly become important in view of a private enterprise executing the project.

The Task Force, therefore, recommends that a high- power committee should be constituted to ensure proper rehabilitation and resettlement. This committee should be composed of representatives of the government, the NVDA, the MPEB and sufficient number of representatives of the families affected by the project. It may also be clarified here that such representatives should not be nominated by the government but should be nominated or elected by affected families. The Task Force hopes that the representatives of the NBA who made valuable contributions to the deliberation of the task force and who have been working with the affected families will be associated with and play a significant role in ensuring model R&R that can be emulated in other projects that would be taken in future. The composition, the charter, the powers and functions of this committee should be carefully worked out to make it a really effective planning and implementing body so that the difficulties encountered in a similar exercise in respect of Bargi do not recur.

In the light of the preceding discussion, the Task Force recommends that the following steps be taken before considering resumption of work of Maheshwar project :

1. Cost benefit analysis be computed again on the lines suggested above.
2. If the fresh computation also shows greater benefits than cost, a comprehensive plan for a rehabilitation programme strictly following the rehabilitation policy as being demanded by the Government of M.P. for Sardar Sarovar from the Government of Gujarat be prepared in a participatory manner by involving the representatives nominated by the affected families.
3. This comprehensive plan should specifically indicate the feasibility of R&R in accordance with the policy particularly availability of land for allotment to the oustees and resettlement of the villages as communities.
4. If the model R&R plan is found the feasible implementation be initiated in an exemplary manner as recommended above with full participation of the affected families.



- 5 The rehabilitation and resettlement must be done in such a manner that rehabilitation and resettlement of families likely affected during monsoon of any forthcoming year should be settled definitely, fully finally and satisfactorily by 31st December of the preceding year without compromise on R & R policy approved.
- 6 All the conditions imposed by the Ministry of Environment and Forest, Government of India while giving clearance of the project be complied with both in letter and spirit for monitoring which an effective mechanism be evolved.

Only after the above steps are taken, it would be possible to go ahead with construction of the Maheshwar Project which the task force feels has more modest submergence and displacement compared to many other projects..



# **A BRIEF REPORT OF THE TASK FORCE CONSTITUTED TO SEARCH FOR ALTERNATIVES OF WATER RESOURCES DEVELOPMENT OF NARMADA VALLEY**

## **I. THE BACKDROP**

### **Development Paradigm Questioned**

1. In the first three decades after independence the strategy of development was based on ideas, approaches and successful experiences of the developed countries. The government was largely responsible for planning and its implementation. The experience during this period, the growing awareness amongst the people and their willingness to take up struggles for their rights, gradual evolution of people-oriented development philosophy as a consequence of complex multisectoral world-wide changes in political, economic and social processes realities, ways of thinking and perceiving have raised serious doubts about the efficacy of centralised planning based on the outmoded western paradigm of development. In the last two decades implementation of major industrial, mining, forest as also irrigation projects have come in for serious criticism and resistance, giving rise to a situation of tension and conflict in which those for and against the projects were engaged in confrontation, although the root cause for the bone of contention - the paradigm of planning and development, has not been seriously addressed in the manner it deserves.

### **Dialogue**

2. The government of Madhya Pradesh taking note of this and with an approach unusual for governments had a series of dialogues with those who were agitating against irrigation projects in the Narmada Valley - the people's organisation, Narmada Bachao Aandolan. Convinced that a decentralised participatory approach was a better course of action, resettlement and rehabilitation of the affected families of Bargi and Tawa projects was attempted in an innovative manner in which the government, the affected people and social workers of Narmada Bachao Aandolan joined hands together. This experiment of working together established a relationship of mutual understanding and trust which was further strengthened by a series of formal and informal dialogues culminating in a national workshop on 16<sup>th</sup> and 17<sup>th</sup> of Dec., 1997 at the Academy of Administration, Bhopal for seriously addressing the underlying and wide ranging issues behind localised confrontations focussing on specific projects. The purpose was to move away from minor specific localized strifes to a rational participatory reassessment, generally, of the basic issues in planning and development and more specifically in the area of water resources management and to evolve a new vision - an alternative paradigm of development and a fresh approach to the planning process. The workshop proved to be a highly stimulating brainstorming event which also highlighted the need to take up the challenge of evolving alternatives and demonstrating their practicability on the ground through Task Forces. The Chief Minister and the Deputy Chief Minister fully endorsed this. The proceedings of the seminar are at Annexure (I).

### **The Task Force**



3. Even while the process of constituting the Task Force was awaiting finality, the people likely to be affected by the Maheshwar hydel power project had already entered another phase of agitation including an indefinite hunger strike led by the activists of NBA. This became instrumental in cutting the red-tape and the issuance, in the month of January, 1998, of the orders constituting Task Forces that would consider and evolve alternatives to the development of Narmada valley, try out the ideas in the basins of two tributaries and also to look at the issue of dam-induced seismicity. Orders constituting the task forces are at Annexure (II).

## **Preamble**

4. This report deals only with the issue of alternatives.
5. The Task Force is conscious of the fact that while it is focusing on the development of Narmada Valley, its deliberations are likely to be relevant to and significant to the broader issue of desirable paradigm of development, particularly for the water and energy sectors. The Task Force, therefore, has taken upon the task as a case study that will provide larger insights on the major issue of development paradigm.
6. With this broad canvas in the backdrop the Task Force has addressed itself more specifically to deliberating upon an alternative plan of development for the Narmada river basin

## **II. WATER RESOURCES**

### **Narmada River Valley Development Master Plan**

7. A close examination, today, of the existing master plan for the development of the Narmada Valley highlights the radical change that has occurred in the approach to the water resources development in the past three decades

The master plan was based on, and conformed to the social philosophy, development paradigm, conceptual framework and planning practices prevalent in 1960's and 1970's when it was largely prepared. A critique of the master plan today would naturally be based on contemporary thinking and approach. It therefore requires to be emphasised that the critique is in no way a reflection on the abilities, competence, understanding and work done by the planners in the 1960s and 70s. It is quite possible that the same planners would have prepared the master plan very differently if they were to take up the task today.

### **The Changing approach**

8. The major differences that have emerged in the approach then prevailing and the contemporary approach are:
  - (i) The earlier approach was that of macro and centralised planning primarily for harnessing the main river and its larger tributaries and therefore projects meant for water impounding were largely restricted to large, medium and minor projects where the minor project was defined as the one that would have command area benefiting 60 hectares or more land.



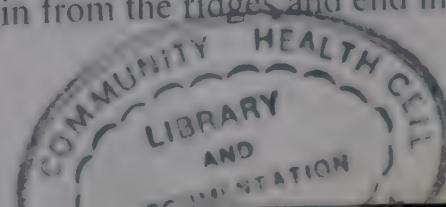
- (ii) The planners used to keep aside 10% of the yields (at 75% dependability) for possible upstream utilisation by way of thumb rule, but there was neither the practice of scientific or systematic assessment of the needs and resources availability in the upstream area, nor a systematic and comprehensive planning for mini and micro water shed development
- (iii) The principle of economies of scale derived from the field of economics and the experience of large industrial projects being the development paradigm, there was a great fascination for larger projects. Gandhian and Schumaker's thesis of 'small is beautiful' or at least the possibility that even small can be beautiful, useful, economic, beneficial and preferable was inconceivable. Accordingly there was a higher priority for larger projects, although smaller projects were not ignored altogether.
- (iv) Cost Benefit Analysis was largely financial and economic. Social and environmental considerations did not get the weightage they deserve according to contemporary thinking.
- (v) Techno-economic viability was the major consideration in location, selection and approval of projects. Problems of social displacement and psychological trauma were no consideration at all.
- (vi) Equity and sustainable use of natural resources were not as significant a concern then, as it has been accepted in contemporary approach.
- (vii) Needs, demands, benefits and costs were based on only the nation as the unit. Local costs or benefits, local needs or resources were not taken into consideration in decision making.

## **Towards Alternative Paradigms**

9. The Task Force feels that articulation of alternative paradigm of development will provide the necessary background for deliberating upon the alternatives to the master plan for the development of Narmada Valley. The alternative paradigm can not be based only on contemporary thinking. It has to be combined with a vision of the future based on successful micro experiments in water resources and energy management, appraisal of the technological advances in these areas and the future trends and institutional innovations that call for greater involvement and participation of people.
10. While attempting a critique of the master plan as well as articulating the alternatives, the task force has taken note of the legal, technical, political, administrative, financial, institutional and structural limitations so that the alternatives presented are not only futuristic but are firmly rooted in, and are in tune with ground realities.

## **Principles or Planning**

11. In the alternative approach there is an obvious and inherent need of adopting a holistic and systematic process of river valley development and planning, based on the broad principles mentioned below which are very different from the premises generally accepted in the past :-
  - a. Planning must begin at the point of origin located in the uppermost reaches of the river basin and then proceed downwards along the minor and the major tributaries, then continue along the main stream till the lower reaches of the estuary.
  - b. Project formulation and execution must also begin from the ridges and end in the valley





- c. Planning and development of the land, water, vegetation, agriculture and human resources in the upstream catchment areas should be treated as integral part of the conjunctive planning process. Surpluses estimated after assessing the optimal upstream utilization should then form the basis of deciding the design parameters of the micro-minor, minor, medium and large dam, with priority being given in the same order.
- d. The conservation, consumptive utilization and the necessary recharge of surface, sub-surface and deeper ground water aquifers, should be treated as inter-dependent and inseparable part of the planning and basin development process.
- e. Land and water resource development should not contravene the limitations imposed by the natural quantum and frequency of precipitation, the natural processes of water run-off and sediment transportation, the natural texture and contours of the land surfaces, the prevailing multi-tiered structure of vegetation and faunal distribution, the wind and temperature patterns and all other relevant geo-morphological conditions.
- f. Planning has to be addressed to end use and fulfillment of needs of the individual, the community and the large national interest.
- g. In planning for agriculture, the process must begin from the conservation and use of in-situ soil moisture, followed by the use of impounded water which follows the logic of drainage-line- harnessing and water- balancing, and finally the use of surplus water in the intermediate and lower regimes
- h. Similarly, resources owned publicly, privately or as common property resources of the community, should be taken together for planning and development purposes. This will enable the planners to estimate more realistic water requirements in the command areas of the large projects. The Government should promote and support the development of all available resources and ascertain that, under no conditions are the poor and weaker sections excluded from the development process.
- i. The scales and locations of the projects must be determined not only on the physical and technical parameters but also on the limitations imposed by the societal and administrative capacity complying with the accepted norms of rehabilitation of displaced persons. Further, the project planning must look at environmental considerations like inter alia submergence of forests, the impact of impounding on the river ecology and means of livelihood-upstream, downstream and at the reservoir; the impact on the tectonic structure, the possibility of reservoir induced seismicity (on which more definite recommendations have to be given by another Task Force constituted by the Government of M. P.) and the possible submergence or destruction of historical / prehistoric and archaeological sites and monuments.
- j. In planning and scheduling of development projects and in financial allocation, the following order of priorities must be strictly maintained:
  - i. Drinking water supply for humans and cattle
  - ii. Protective irrigation for the Rabi crop



- iii. Irrigation for cash-crops
- iv. Hydropower
- v. Industrial use
- vi. Releases for diluting and flushing civic and industrial wastes
- vii. Navigation
- viii. Minimum water releases for keeping the river courses alive.

## **Planning for Upstream Areas**

12. It was agreed that in conformity with the principles laid down above, all planning for the future must include a scientific assessment of the availability of water and the optimal utilisation potential in the upstream areas.
13. It was also accepted that by now sufficient amount of field experience has become available to indicate that upstream impoundment and utilisation (as a proportion of the estimated yields before development) can be quite high although, on the quantum the members of the Task Force were divided. One view was that it can be as high as 35% in areas having annual precipitation varying between 500 to 700 mm and as low as 10% of the expected yield in subcatchments where the precipitation exceeds 1800. The other view was that as the flow was concentrated in a few days and occurred in flash floods, it may not be that high. It was agreed that the thumb rule of treating 10% of the average annual yields as the maximum possible quantity of upstream utilisation, had now become irrelevant and unrealistic. There is a need to look at the quantum available more scientifically and systematically.

## **Impounding of Water**

14. Even if executed scientifically, watershed development will be able to hold back and optimally utilise approximately 30% of the yield. In addition, it is known that 75% of the precipitation occurs during the monsoon and a substantial amount of it flows downstream by way of torrential runoff. A logical implication of this is that small, medium and large dams may be required on the major tributaries and the main streams, albeit with relatively smaller storage capacities necessary for impounding the residual surpluses.

## **Norms for Projects**

15. After assuming the need for impounding the residual surpluses, it has been accepted that only those projects which satisfy the norm of economic and financial viability, and which are capable of complying fully with those norms of rehabilitation and resettlement which the Govt. of M.P. is demanding from the state of Gujarat for the PAPs of the Sardar Sarovar Project (which will be referred to as current norms hereafter), and which are able to comply with all the conditions of the Environmental Protection Act, 1986, (read with the rules and guidelines framed under this Act) should be taken up for execution and implementation.

The Task Force emphasizes that due to the problems of human displacement, the trauma of social dislocation and psychological stress, the realistic limitations in finding adequate land for rehabilitation including for allotment to the affected people for cultivation, and for resettlement as a community, and the immense bottle-necks in the flow of adequate finances, it is becoming



exceedingly difficult to establish the economic feasibility or social justifiability of the large and medium projects.

16. The viability of a project should not be based on purely economic cost benefit analysis. Socio-cultural and institutional costs should also be included. In order to take into account the impact of cost over-run, time over-run, increase or decrease in the actual benefits to society, occurrence of natural or man-made disaster, and similar other significant variables, the project should be assessed on the risk sensitivity criterion. Burden of costs on different segments of society and the quality and access of benefits to them, environmental sustainability, sustainability of socio-cultural institutions should be other parameters for assessment of the viability of the projects. In the environmental sustainability criterion, the impact on forests, wild life, flora and fauna, economic activities like mining, quarrying etc. in the submergence area should be properly computed and reflected in the cost, in addition to the broader question of sustainability

## **Completed Dams and Canals**

17. In care of the completed dams, and their canal systems, the Task Force recommends that in place of the monolithic distribution systems, en-route storages should be created, where feasible, along the main canals. But beyond the en-route pondages, the distribution and management of water should be left to the user groups of farmers. This decentralised system combined with the scientific techniques of achieving water use efficiency in agriculture will further optimise the use of water. It is therefore recommended that the local community should be made responsible for rationalising the system of water tariffs based on agreed priorities.

## **Prioritization in Allocation**

18. It is noted that at present, only 1200 schemes out of the 3000 minor schemes planned in the NVDP had been executed. Therefore, in view of the stringent financial constraints experienced in the State, the Task Force recommends that the limited financial resources available with the Government should be utilised for completing the 1700 remaining minor irrigation projects. By implication, instead of using the scarce capital for starting new major or medium projects, priority should be given to micro and mini water impounding structures in the upper catchments, followed by the minor irrigation schemes. It was also noted that there is further scope for a more systematic and scientific survey to identify additional minor projects.

## **Decentralised Planning**

19. Decentralized planning-of water resources would require an appropriate unit. Ideally the natural boundaries of a sub-basin should be treated as the smallest unit of planning. Development blocks may be restructured to be co-terminous with such units. Region having organic socio-cultural and geophysical similarities within the basin of a tributary should be treated as the unit for planning at the next level.

Recognizing that such radical restructuring of administrative boundaries may not be feasible in the short run, the boundaries of a natural village, should be created as the smallest unit of planning, and all such villages which are interdependent, should form a cluster of villages or micro-catchments within the natural boundaries of a micro catchment or a sub-basin. Decentralised village plans will not imply exclusion of other areas but would include the principle of interdependence between the villages (For example a block or a Janpad as an



administrative unit). The block should be treated as the optimal unit for a decentralised plan. At the next level, the regions having socio-cultural and geophysical similarities within the basin of a tributary would be treated at the macro planning level.

20. Decentralised planning would also imply holistic agricultural planning including the determination of the appropriate crop-pattern for ensuring nutritional (food) self-sufficiency.

Implementing decentralised planning would require a considerable amount of internal regulation for which necessary innovative institutional structure will have to be evolved and some of the existing institutions like Gram Sabha may have to be restructured and empowered to be equal to the task. In this successful model of institutional structures evolved in some experimental programs of the Govt. and NGOs may have many lessons to offer.

## **Watershed Development**

21. Scientific watershed development would include all techniques related to soil moisture conservation and retention, recharge of ground water, recycling or multiple use of water, and finally productive or intensive use of water. The application of the full range of techniques would require long-term training and education for the Government officials concerned along with the local people and voluntary workers. Resource persons and competent experts would have to be identified first within the community and later exogenously, so that the development process can be implemented efficiently and swiftly.
22. The Task Force recognizes the fact that during the 1980's and especially during the 90's the concept of comprehensive watershed development has gained importance and popularity within the Government and non-Government circles at all levels. The work of the Rajiv Gandhi Mission, the Eco-development plans and Wasteland restoration plans of the Forest Department, the Integrated Rural Development Programs taken at the district level, the soil and water conservation programs taken up by the Agriculture Department, and other programs funded by CAPART, and other National and International voluntary agencies, are an indication of the growing realization that without watershed development, river basin planning and development would be incomplete.

The Task Force also notes that even though the attempts made by above mentioned organisations are well meaning and genuine, they continue to be adhoc, sporadic and unscientific. In most cases they have been treated as welfare programmes, employment and revenue generation programmes, or purely as conservation programmes. They have therefore been allocated financial resources barely appropriate for experimental, subordinate or peripheral supportive activities.

## **Co-Ordination of Watershed Development**

23. In order to achieve co-ordinated and sustained effort for the programme, it is recommended that the efforts of different departments working in the field of watershed development should be co-ordinated through a high-powered coordinating committee constituted by representatives of different schemes working in this programme. Since the strongest contingent of land and water resource engineers exists with the Water Resources Department, and since they already have access to a fair amount of data, the Water Resources Department should be made the



Nodal Agency for planning. Just as the Forest Department has opened up separate wings for Research and Extension, Wild Life and Vaniki Pariyojna (Joint Forest Management) etc., which follows all the participatory procedures of planning, decision making and execution, so that the micro-watersheds can be gradually handed over to the local communities and organizations.

24. In order to provide adequate financial resources, the funds available with the Water Resources Department can be partly diverted to the watershed sector. The possibilities of external / foreign financial aid were considered by the Task Force, but it was finally agreed that foreign funds usually come with strings attached, carry a high interest burden, are often unreliable and should therefore be avoided. The implication is that, there is no alternative but to allocate a part of the existing resources from the Water Resource Department to the Watershed Sector under the principle that, watershed development also generates a considerable irrigation potential.

## **Trying Out**

25. An important recommendation that emerges from the discussion on holistic planning with a new approach was that one of the tributaries of Narmada namely the Goi river basin which has a total area of 2,15,000 hectares, should be taken up immediately for trying out the new paradigm. The Task Force feels that taking up comprehensive planning of the Goi basin on the above mentioned principles would enable the NVDA and the communities residing in the valley to understand and appreciate the merits of holistic river valley development. It is estimated that for planning and executing such a project, at least 60% of the geographical area of the basin would have to be treated scientifically, if demonstrative results are to be achieved. At current estimates (at 1997-98 prices) a comprehensive river basin plan would require Rs. One hundred and sixty crores (Rs. 160 crores) at the rate of approximately Rs. 20,000/- per hectare, which would create an irrigation potential of 80,000 hectares of land in addition to 15,000 hectares being irrigated presently.

It is further recommended that besides taking up the Goi basin for comprehensive development, a few other sub-basins may also be taken up within and outside the Narmada valley for similar comprehensive development. The selection of these micro-catchments should be taken up on the basis of stratified sampling based on different geo-cultural features, so that the inferences and results can be generalized. The task force recommends a rigid time schedule for the above mentioned exercise consisting of, a maximum of one year for survey and planning, and four years for implementation.

## **Need Assessment**

26. The Task Force feels that there is need to give at least an equal, if not greater, importance to satisfying the needs of the local communities, while at the same time creating surpluses for the national economy. It is also stressed that perspective planning must account for not only the needs of the present generation but should also calculate the needs of the future generations. Further, the perspective plan should take into consideration, the eventual possibility of inter sub-basin transfers for achieving a balance or equity between different areas within the same river basin. An important precondition for such inter sub-basin transfers would be the complete development of all resources within a specific sub-catchment. Further, it was agreed that such transfers (export or import of surplus waters) should be attempted only after all possibilities of satisfying demands within the sub-basin have been tried and after the future needs of the river basin have been fully assessed.



## Water Rights

27. The Task Force feels that in respect of water, along with the rights of the states, the rights of the community and the individuals should also be recognized. The domestic requirements of an average household should be calculated at the rate of 60 litres per capita per day for humans, plus an equivalent quantity per capita of the livestock (bovine), plus protective irrigation requirements for an average land holding of 2 hectares per household. Such an assessment would indicate the minimum or primary requirements for water. It was agreed that every rural household should have a water right equivalent to its primary requirements. Water requirements in excess of primary use, i.e. for intensive and cash crop cultivation would have to be negotiated at a price to be determined within the community. Water resources in excess of the primary demands would belong to the community and would be distributed or transferred in such a manner that it ensures equity, sustainability and larger national interest.
28. In respect of planning for urban water requirements the Task Force finds and it was that it forms a very small proportion of total water requirements in an area. Deliberating upon case study Indore as a (not in the Narmada Valley but receiving water from the Narmada ), it was recognized that use and mobilization of extraneous water to satisfy water requirements should be resorted to only after optimum development of existing and local water resources. The importance of equitable water distribution between the classes and guaranteed access of water to the poor, along with prioritization of basic needs such as drinking or domestic water needs over conspicuous consumption of water through water parks and the like needs to be ensured.
29. It was also recognized that water conservation has to be done through the use of both tariffs and technologies. For example industrial recycling of water can lead to significant water saving. Similarly, rationalization of tariffs and differentiated tariff structures for domestic and commercial use will lead to rational use of water and better utilisation of local, low cost structures such as tanks and wells, as well as a more realistic assessment of the water needs of an urban center. Apart from choice of development of water resources and its costs and distribution, the other important issue related to water in the cities is the discharge of waste water. This needs to be carefully designed so as not to pollute the water resources of the valley.

## Indira Sarovar ( Narmada Sagar ) Project

30. The task force discussed the Narmada Sagar (also called Indira Sagar) Project and its impact in great detail both to come to an understanding about further steps required vis-a-vis this project, as well as a case study leading to broad inferences to be used for the other large projects in the valley.

The Narmada Sagar project has been planned for irrigation, hydel power and for providing regulated releases of water to Omkareshwar and Maheshwar projects in Madhya Pradesh and eventually to the Sardar Sarovar project in Gujarat, in accordance with the Narmada Water Disputes Tribunal Award ( NWDTA ).

31. The NVDA's viewpoint regarding the ISP is that it is the most important project for the development of lower Narmada valley because the Punasa site is the only location over a distance of 785 km where substantially large water storage is possible. The NVDA also emphasizes that even though regulated releases of water to Gujarat State for complying with



the Award are possible in the absence of ISP, this option would imply a release of a vast share of water to Gujarat without deriving any benefit from it for M.P.

32. On this issue the NBA's views divert substantially with those of the NVDA. The NBA believes that the construction of ISP would lead to submergence of 249 villages and uproot more than 30,000 families. At present there is no rehabilitation plan and there appears to be no possibility of finding sufficient land for their rehabilitation as per the rehabilitation policy of the year 1989. They further point out that the project authorities have been paying cash compensation and, by implication, have failed to comply with the rehabilitation policy. In addition, the principle of rehabilitating the PAP as communities has also not been complied with since the authorities are only establishing rehabilitation colonies without agricultural land around for the settlers, while rehabilitation villages should be established along with agricultural land.

Their contention is that this would inevitably imply an enormous scale of human trauma unacceptable to civil societies. Further, it points out that when such trauma along with the enormous environmental damage, prejudicial impact on the health of the people residing on the periphery of the reservoir and an irretrievable loss of archaeological and cultural heritage is quantified and added to the direct cost of the project, the project is unable to comply with the minimum norms of economic and financial justifiability.

It is also pointed out that if the conditions mentioned in the environmental clearance are not complied with, the conditional clearance is likely to lapse. Therefore it is absolutely necessary that all conditions are complied with.

It further points out that ISP would irrigate at the best 50% of the command area as against the claim of 70% made by the project authorities. The NBA therefore clearly rejects the possibility of executing ISP in its existing form.

33. The NVDA does not agree with this position of the NBA. It holds that while human trauma in projects of such kind and magnitude should be kept to the minimum, it cannot be completely avoided. The NVDA also feels that rehabilitation and resettlement need not necessarily be insensitive and that the machinery can be refurbished to undertake R & R in a humane manner by posting sensitive personnel, at all levels.

The NVDA also feels that invoking provisions of the MP Projects Displaced Persons Resettlement Act, 1985 and by other appropriate policy measures, it may be possible to provide land for land to those displaced and settle them as communities.

34. The Task Force feels that as a result of substantially large affected villages and PAP, besides the human and social costs involved in the submergence will also lead to environmental problems affecting wildlife and aquaculture. It will also involve archaeological post-impoundment prejudicial impact on the health of the inhabitants on the periphery of the reservoir. All these issues need concern and careful considerations. The environmental clearance has been given to them subject to certain conditions and these must be fulfilled not only in letter but in the spirit too.
35. After weighing and balancing the views expressed regarding the project, keeping in mind the fact that the Government of MP is contesting the award of the Tribunal and asking for its review and modification, the task force makes the following recommendations:;



- (i) The authorities should give the topmost priority to the formulation of a rehabilitation plan, which recognizes the PAP's constitutional rights to proper livelihood and provides land-for-land, according to the preference of the PAP and which invokes the provisions of the MP Projects Displaced Persons Resettlement Act, 1985, for acquiring land from beneficiaries in the command area. It is anticipated that this is likely to give rise to hostility between PAPs and local inhabitants who are beneficiaries in the command area. To avoid this it is suggested that the government and social scientists must perform their duties through sensitive negotiators. If despite such efforts and negotiations, the beneficiaries wish to reject the irrigation benefits because they have to give up all their land, the justifiability of the ISP even in the national interest will require deeper consideration. If the beneficiaries are not willing to get irrigation on the condition that they part with a part of their land, availability of land for R & R becomes highly questionable.
- (ii) An effective mechanism be evolved and set up to monitor environmental impacts and to ensure the compliance of the conditions of environmental clearance.
- (iii) A study should be undertaken for formulating an alternate scenario keeping in mind the possibility that the stand taken by the Government of Madhya Pradesh in the petition submitted to the government of India and which the Honourable Supreme Court, is finally accepted.
- (iv) A complete review of the economic viability of the ISP should be undertaken, and fresh benefit-cost ratio derived after quantifying all the realistic human, social and environmental costs.
- (v) It is necessary to find out the benefit-cost ratio of ISP assuming that the 'Nadkarni Model' of development is adopted.
- (vi) It is necessary to analyze and ascertain the extent to which human trauma can be reduced at different heights (FRL) of the dams, retaining its present nature of a multipurpose project. Similarly, it is necessary to find out the maximum required height of ISP, if it is envisaged only as a power project.

### **III. ENERGY AND POWER**

#### **Needs and Demands: National and Local, High and Low priority**

36. As per the 15 EPS Survey of CEA there would be a shortfall in power in Madhya Pradesh as under:

At the End of Ninth Plan : 7,500 MW

At the End of Tenth Plan : 10,000 MW

37. Some members hold the view that there are problems in the manner the demand forecasts are arrived at and they could be overestimates. The shortfall as today, as per the MPEB is reported as 1805 MW (and with a 70% PLF, needing 2500 MW of capacity). Due to the functioning of the captive power policy, the peak requirement from the grid has shown a downward trend. While the trend of increase in demands is not in question, there is a need to examine the forecast of demand rationally and arrive at a more realistic assessment. It was also noted that



the demand is usually viewed in aggregate, while desegregation may enable differentiation and prioritization between different kinds of demands. It can not be denied that a part of the forecasted demand falls in the category of low priority or conspicuous consumption. Inclusion of such demands in the national demand aggregates leads to a situation where socially less justified consumption is also met by investing scarce public funds. It therefore needs to be emphasized that, in a welfare state the responsibility of public sector is far greater in case of the primary energy requirements of the deprived sections, and lesser in case of the low priority or conspicuous demands for energy. The M.P Electricity Board while preparing plans for energy generation based on demand projections, should distinguish between primary and priority demands and the demands which should have the low priority and which are for conspicuous consumption. If demand aggregates are so bifurcated, then the responsibility of the M.P Electricity Board would be primarily for the priority demands. Consequently, the projected deficit in the demand and production would be scaled down substantially from the figures mentioned above.

38. MPEB is of the view that electricity is one of the key inputs for the overall socio-economic development of the country and it is the basic responsibility of the power supply industry to provide adequate electricity at economic cost while ensuring reliability and quality of the supply. While agreeing with this stand of the MPEB the Task Force feels that taking into account the huge subsidies - open and huge - involved in supply of power, progressive thinking demands distinction being made between the aforesaid two types of demands and stressing that the responsibility of the state sector must focus on high priority demands.
39. It follows that the responsibilities of the public sector which relies largely on scarce capital resources raised through taxation and other public resources should be used principally for investing in projects which satisfy basic human needs. The responsibility of generating power for the affluent community could be largely left to the private sector.

The Task Force recognizes that there is a need to prioritize the demands, and address the issues of justification of demands. The Task Force also recognizes the need to evolve criteria for this. Wherever necessary, the use of differentiated prices, taxes and surcharges should be made for making conspicuous use of energy prohibitive. The private sector should be given a much greater role in meeting the remaining demands.

## **Supply and Demand Side Optimization**

40. Planning in the energy sector should be in a decentralized manner, as recommended in paragraphs 20 to 24 for the Water Resources. The unit of planing can also be similar. Once such decentralized planning becomes an established system, the principle that transfer of resources from one planning unit to another, should take place only when the latter has used and optimized its own resources, should be followed. Following this in the case of power, before the local resources of a unit are to be transferred to another unit through a grid, it is also necessary that the operation of the grid must be optimized.

The Task Force recognizes the growing needs and demands of the energy Sector, although on the quantum of demand, there can be different views since the method of estimating demand can be questioned on many grounds. The Task Force also believes that improvement in the efficiency of existing capacity can meet a portion of the supply-demand gap.



41. In this regard the Task Force recommends that all possible efforts may be made for reducing wastage of power - for example by minimizing the T&D losses, by refurbishment and modernization of existing plants, improvement of PLF and so on (supply side measures- SSM). The Task Force noted the good efforts made by MPEB in this direction but also felt that much more needs to be done, and such measures need to be included as an integral part of the overall planning.

Similar measures need to be taken on the demand side, including the use of efficient end use appliances, energy audits, fuel substitution and so on. The need for tariff rationalization and universal metering is also recognized as critical to improving user end efficiencies and avoid wastage and pinpoint camouflaged thefts- industrial and others (demand side measures - DSM).

## **Renewable and Non-Conventional Generation**

42. The Task Force has deliberated carefully upon the feasibility of large-scale utilization of the non conventional and renewable resources for the decentralized generation of electricity and energy. In this regard, the Task Force recommends the creation of a very strong section within the MPEB for the development of the decentralized non-conventional and renewable energy / electricity, to be headed by a Vice-Chairperson.

Further, the Task Force recommends a series of orientation and training programmes for the power engineers and policy makers on the same.

## **Integrated Resource Planning or Least Cost Planning**

43. There is a need to integrate all the above i.e. supply side measures, demand side measures and harnessing non-conventional and renewable resources, along with conventional centralized sources of energy / electricity in a unified planning exercise for the following reasons :

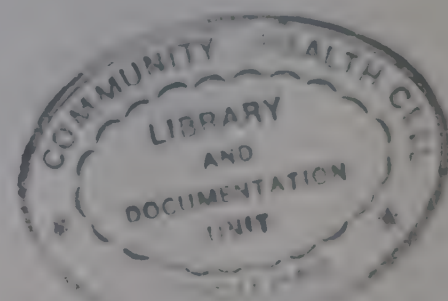
- Need to compare the SSM, DSM, conventional and non-conventional options on a level playing field in terms of costs - financial, social and environmental.
- Need to recognize that in many cases energy and electricity can be used interchangeably.
- Need to recognize that supply side measures and demand side measures are significant before considering generation options.

44. The methodology of integrated resource planning or least cost planning integrating all the above is recommended for adoption for energy /electricity planning in the State.

The Task Force recommends the commissioning of a suitable consultant to develop the ideas of integrated energy planning into a 20 years perspective plan and a series of projects.

45. An important point recognized by the Task Force is that the issue of alternatives goes beyond that of power and even the Narmada Valley, and touches upon the very issue of development paradigm itself.

## **Technologies and Options**





46. A series of technologies and options for all the above - SSM, DSM, non conventional and renewable generation technologies have been deliberated upon by the Task Force, including the potential, costs- financial, social and environmental, as well as institutional issues. It has taken note of some interesting ideas and experiments on SSM, DSM like use of compact fluorescent lamps and retrofitting of agriculture pump sets, renewable and decentralised generation, particularly biomass, and micro-mini hydel, and hybrid systems of biomass-solar-small hydel. However, the cost and feasibility of these and the claim that the costs of many of these, such as biomass based generation are cheaper than the conventional hydro options and achievable in a shorter time, need to be convincingly demonstrated before large-scale adoption can be considered.

In this connection the Task force also notes that comparative economics of non-conventional energy sources and conventional power projects requires to be analyzed in detail, in case of each project after taking away the elements of subsidy. In this comparison quality of power, economies of scale and environmental impact should also be taken as parameters, in addition to other parameters usually applied.

47. The Task Force would recommend that the M.P.E.B. should study in depth:

- The experience of California where DSM and other programmes have helped California keep its per capita electricity generation at the same level in 1992 as it was in 1979- while it rose by nearly a fifth in the rest of the US.
- Options for restructuring the existing or planned projects to get more out of them like installing 180 MW additional capacity at Bargi dam- where the social and environmental costs have already been paid - to make use of monsoon spills for additional generation and then using the same in post monsoon periods for pumped storage facility.
- Options of high head, low submergence pumped storage schemes like one named Kabir Path pumped storage scheme of 6000 MW capacity with about 1000 ha submergence of the top and bottom reservoirs together, prepared by Late Shri Matin Ahmed of the NVDA many years ago.
- Whether a holistic energy-water-land planning in the valley is possible and necessary and whether the extensive watershed development and irrigation based on an institutional norm of energy self sufficiency, can lead to the creation of adequate bio-mass potential in the Valley, which can be used to generate energy / power.
- The economics and feasibility of large-scale expansion of the successful experiment of bio-gasifiers, on the lines of Taragram village near Orchha in district Tikamgarh.

48. The Task Force has had a look at and appreciated a Village Energy Survey conducted by the villagers of a village near Maheshwar named Sulgaon. The Task Force also recommends that the Govt. of M.P. / M.B.E.B. / Non Conventional Energy Development Corporation should support implementation of village-based decentralized system of energy-generation of around 500 KW to 2MW based on biomass, dung and other local resources in villages in order to test the feasibility of achieving self-reliance while providing employment to local youth simultaneously.

49. Demand for 'energy' should not be taken as synonymous with 'electricity'. In many cases electricity and other forms of energy are likely to be used for the same end use - for e.g. process heat, and in such cases such sources could easily be substituted for electricity. Wherever possible such other forms of energy should be promoted by appropriate policy measures including incentives and disincentives.



50. An important observation of the Task Force is that the energy options should not be looked at in isolation, nor should they be compared in isolation. On the other hand it is necessary to appreciate the importance of looking at the whole set of energy options in terms of 'combinations' or 'mixes'. Further, it is felt that different sets of energy combinations need to be used during the monsoon period and the lean period. Similarly different combinations of hydro power, thermal power, solar power and biomass energy, need to be tried out at different scales of production and consumption, keeping in view techno economic viability. On the question- whether, with the maximum possible utilisation of SSM and DSM and all possible non-conventional energy options in near future, there will still be a need of increase in generation through thermal and hydel sources or not- the Task Force was divided, primarily because the feasible quantum of generation through such non conventional sources can not be established in a precise manner, being a comparatively virgin area.
51. The Task Force recognizes that almost all conventional hydel power projects and some thermal power projects lead to substantial displacement of people causing severe social-disorganization and human trauma. It was however felt that when such projects become necessary and desirable, they should be implemented with a human face - in a humane way. Also the extent of displacement should be taken as an important criteria for the choice of a project. With these cautions, the broad consensus, with NBA's representatives disagreeing, seems to be that conventional power projects will continue to be relevant and necessary, but the planning, selection, choice, location and execution of such projects should be based on a fresh cost-benefit analysis with the new parameters suggested by the task force and only if they are found to be viable and acceptable from all these angles, they should be implemented avoiding, to the maximum extent possible, displacement and trauma. The Task Force feels that full consensus can be achieved in this regard when the feasibility and constraints of scaling up the successful and techno-economically viable non-conventional energy systems become clear. Accordingly, it is recommended that experimental projects of large scale non-conventional energy sources be taken up in different parts of the state in order to test viability, economics and sustainability

### **Regulatory Authority**

52. The Task Force recognizes that the questions of cost benefit and its acceptability, the issue of economic feasibility and social justifiability, the issue of whether the, implementation is being done with a "human face, the prioritization of the demands and so on are issues which will need certain mechanisms for resolution.
53. For this a people-oriented, transparent, public commission will be an ideal mechanism. However, the Regulatory commission envisaged for power sector or a commission suggested in the draft rehabilitation policy of the state with appropriate modifications, to ensure people's representation people-orientation and transparency can serve the purpose.

### **Phases of Implementation**

54. The alternative approach outlined above can be implemented in a phased manner. The phases will be similar in the case of the water and power projects. In case of power projects there is a need for the statewide planning to be done on the basis of integrated resource planning. The SSM and DSM be taken up on a priority basis. This will not only be cheaper but will start giving benefits immediately / in the short term. In the first phase, studies and experimental programmes suggested above should also be taken up to enable clear picture the next phase.



This can be accompanied by other decentralised generation options that would offer benefits in the medium / short terms. These would include options like industrial co-generation etc. Another range of medium term options would be the restructuring of the current conventional projects - for example, running the planned F.O.based plants for peaking instead of base load operations.

Finally, based on the results of the recommended studies and experiments there will be the medium term / long-term options including biomass based generation, solar hybrid and others. This will have the advantage of yielding immediate benefits comparable to the current plans, without their social and environmental impacts and allow for a transition to the sustainable long-term options.

In conclusion, therefore, all future investments in power generation should concentrate on optimizing the energy mix on the one hand, and relying more and more on the renewable and environmentally benign sources of energy on the other. Phasing out the finite and expensive resources of energy which carry a high socio-environmental cost burden, should be the accepted policy.



Government of Madhya Pradesh  
Narmada Valley Development Department

(English Translation)

Serial No: F12-1/112/27/2/97/534

Bhopal Date 02.05.1999

To,  
Vice Chairman,  
Narmada Valley Development Authority,  
Narmada Bhavan,  
Tulsi Nagar, Bhopal.

Subject: In the context of various projects under the aegis of the Narmada Valley Development Department.

After reviewing the various projects in the Narmada Valley, the state government gives the following orders about their implementation –

1. Keeping in mind the status of the affected people of the villages to be affected this year by the Indira Sagar Project, any work on the spillway section of the dam that will cause an increase in the submergence will be suspended until the 15<sup>th</sup> June, 1999.

In the context of the award given by the Narmada Waters Disputes Tribunal (NWDT), the state government has made a petition and arguments in the Supreme Court to constitute a new Tribunal. Remaining within the context of this plea and petition, the various aspects of the Indira Sagar Project will be reviewed by the state government alongwith the affected people of the submergence zone, representatives of other people's organisations, and experts. The State government will nominate the names of such organisations, experts and representatives on the proposal of the Narmada Valley Development Authority. The said review should be completed by 31.10.99.

2. After reviewing the current situation in the Man and Jobat projects, it has been decided that no such work will be undertaken on these projects which may submerge any village in the monsoon of 1999. Simultaneously, a Punarwas Ayojan Samiti (Rehabilitation Planning Committee) will be constituted in order to ascertain well-planned rehabilitation. This committee will plan for the total rehabilitation of the oustees. The committee will keep in mind the rehabilitation and resettlement of families living in the areas likely to be submerged due to the construction work up to 15<sup>th</sup> of June of any year, should be completed by the 31st of December of the preceding year as per policy.

For effective rehabilitation, the Madhya Pradesh Project Affected Persons Rehabilitation Act, 1985 will be used as found necessary, for which the work of framing rules will be taken up separately.

For effective rehabilitation, a planning committee will be constituted under the chairmanship of the Minister, Narmada Valley Development Department in which the representatives of the oustees will also be included. This committee will be constituted by 31<sup>st</sup> May, 1999.

3. The Task Force constituted by the state government has recommended that there is a great deal of new thinking about irrigation all over the country and the world. Since several types of



alternative forms (to big dams) of irrigation are now available, these possibilities must be explored in Madhya Pradesh. Consequentially, the Madhya Pradesh government has taken a decision that the alternatives to the Upper Veda and Lower Goi projects must be explored, because there has been either no work or very little work on these dams. The Narmada Valley Development Authority and the people's organisations along with representatives nominated by the Narmada Bachao Andolan will jointly search for such alternatives to these projects, through which, at least, the extent of irrigation originally proposed for the given command area will be made available. The possibilities of decentralized energy planning in this area will be explored during this process. The committee to conduct this study will be constituted by 31<sup>st</sup> May, 1999.

After studying the command area of these dams, within 6 months, a plan for the provision of irrigation through alternative means will be prepared, after which micro-plans will be prepared. These will be examined for their utility and their implementation will be done after due consideration.

4. Implementation of the decisions taken for the total rehabilitation of the Bargi dam oustees in the concerned Rehabilitation Planning Committee, as well as the agreements made from time to time with the organisation of the Bargi dam oustees formed up within one month.
5. In January 1998, the state government has constituted a Task Force to conduct a detailed study of the relationship between seismic activity and dams. The Disaster Management Institute of Madhya Pradesh has been given the responsibility to implement this study through a Task Force. The state government expects that the report of this study will be presented by 31.10.1999. Finances for this study will be provided by the Narmada Valley Development Authority.
6. The state government has also taken a decision that steps should be taken to apply the Madhya Pradesh Project Affected Persons Rehabilitation Act of 1985 to all irrigation projects in Madhya Pradesh. In the context of this, a draft of the rules and regulations for this Act will be prepared on the advice of Narmada Bachao Andolan and other concerned parties and submitted to the state government by 30<sup>th</sup> June, 1999.
7. It has been brought to the notice of the state government that because cash compensation is being paid in lieu of agricultural land and house plots, various types of problems are arising. as a result, the state government desires that the Narmada Valley Development Authority should review all aspects of this issue and give a suitable proposal to the state government within a period of two months in order to formulate policy.

Ravindra Sharma,  
Additional Chief Secretary,  
Government of Madhya Pradesh,  
Narmada Valley Development Department



## Status of Irrigation in the Narmada Valley Projects

Sl. No.	Name of Project	Planned Annual Irrigation (Ha)	Annual Irrigation						Average Irrigation	
			In 1991-92		In 1992-93		In 1995-96			
			(Ha)	% total Planned	(Ha)	% total Planned	(Ha)	% total Planned	(Ha)	% total Planned
1	Bargi (Rani Avantibai Sagar)	219800	12100	5.51%	15000	6.80%	4700	2.10%	10600	4.82%
2	Matiyari	13662	3058	22.38%	2964	21.69%	718	5.25%	2247	16.44%
3	Kolar	60876	10891	17.89%	20906	34.34%	20000	32.85%	17266	28.36%
4	Tawa	332783	175914	52.86%	187444	56.32%	176290	52.97%	179883	54.05%
5	Barna	60512	33775	55.86%	32740	54.10%	31163	51.50%	32559	53.80%
6	Sukta	18583	4062	21.86%	900	4.84%	5190	27.93%	3384	18.21%
Total		706216	239800	33.96%	259954	36.80%	238061	33.71%	245939	34.82%

Source: Narmada Control Authority, Annual Water of Narmada Basin Upto Sardar Sarovar Dam site-Year 1991-92,

1992-93, 1995-96











